Distribution and Recent Management of Introduced Fishes in Oregon

Kin Daily
Warmwater Fish Biologist, Oregon Department of Fish and Wildlife

Current Distribution of Introduced Fishes

At least 23 species of introduced game fish are found in freshwater habitats in Oregon. These include four species of salmonids, American shad, striped bass, and 17 spiny-rayed fishes classed as warmwater or coolwater game fish. The salmonids include brook, brown and lake trout, and Atlantic salmon. The spiny rayed group includes large and smallmouth black basses, walleye, catfishes, and several species of “panfish”. Some non-game species are also introduced, most notably common carp and grass carp. The current distribution within the state is the result of deliberate stocking for fisheries, the natural spread into new habitats (such as walleyes in the Columbia, which are believed to have originated in Washington) and by illegal transfers of fish. The black basses and panfishes are the most widely distributed, with at least six species occurring in each of the state's 18 river basins. Brook trout are the most widely distributed non-native salmonid, occurring in all but the coastal basins. Distribution of the other non-native game fish species is much more limited.

History of Introductions

All of these fishes came to Oregon through the efforts of persons or agencies that saw benefits to their introduction. Most initial introductions into the state occurred before the turn of the century when there were few restrictions. Ben Hur Lampman in his book "The Coming of the Pond Fishes" (Binfords & Mort, *Publishers*, Portland, Oregon, 1949) did a thorough job of documenting early introductions, starting with the escape of carp from a pond at Troutdale in 1881.

Early settlers were eager to establish the good eating, white-meated fish they had been accustomed to "back home". Since those early years, little has changed in the mainstream public attitude and education regarding the introduction of new species. In the early days fish introductions by private citizens were unregulated. Even today many people are unaware of or disregard state restrictions on the transport and release of fish. Therefore each year new species show up in new places.

Warmwater fish species were brought to Oregon late in the nineteenth century and were stocked into many of the coastal lakes in the 1930's. ODFW records show that Tahkenitch Lake was stocked with 20,000 warmwater fish of "unknown" species in 1935, followed by catfish, largemouth bass, crappie and bullfrog in 1937-38. Yellow perch must have been included with the "unknowns". It probably didn't take long for these species to be carried the few miles to Siltcoos and other Florence area lakes.

ODFW stocking records for warmwater fish show that Devils Lake received 90,000 "catfish" in 1928 and thousands of "unknowns" in 1933, 1934 and 1935, followed by catfish, largemouth bass, crappie and bluegill in 1936.

The Tenmile Basin Fish Management Plan states that bullhead catfish were stocked in Tenmile Lakes in 1920. The district reports that yellow perch were present before the 1950's. Apparently other warmwater species were slower to arrive, as bluegill were not found there until 1964. The lake system was treated with rotenone in 1968 to eliminate bluegill, bullheads and perch for the benefit of coho. However bluegill soon reappeared and largemouth bass were stocked in 1971 to prey on them. Crappie and yellow perch have also shown up in recent years.

Table I. First Introductions of Non-Native Fish Species into Oregon Waters (from The Coming of the Pond Fishes by Ben Hur Lampman, 1949).

Species	Year	Location
American Shad	1876	Columbia River; migrated from 1871 plant in Sacramento River
Carp	1880	Willamette Valley in Lane County; Columbia River in 1881
Brown Bullhead	1880	Willamette Valley in Lane and Yamhill Counties
Largemouth Bass	1888	Willamette River near Salem and Oregon City
Green Sunfish	1890's	Thought to have immigrated from Washington plantings
Black Crappie	1893	Willamette River near Salem
White Crappie	1893	Willamette River near Salem
Bluegill	1893	Willamette River near Salem
Pumpkinseed	1893	Willamette River near Salem
Warmouth	1893	Willamette River near Salem
Channel Catfish	1893	Willamette River near Salem
Yellow Perch	1904	Columbia River; from 1894 plant in Silver Lake, WA
Yellow Bullhead	1905	Willamette River at Portland
Striped Bass	1914	Coos Bay; migrated from 1879 introduction in San Francisco Bay
Smallmouth Bass	1923	Lake Oswego
White Catfish	1930	Willamette Valley

Rules and Policies Governing New Introductions

ODFW has regulated the introduction, transport, and stocking of fishes through its administrative rule authority for many years. In addition, ODFW is bound by rules which regulate its decisions regarding the movement of fishes to new areas. The framework of protective rules is intended to restrict unauthorized establishment of any fishes, whether native, non-native, hatchery, or wild. Transport permits are the primary basis for regulation of the movement of live fish and avoidance of stocking in areas where they may be detrimental. Permits are required to transport, hold, or release live fish. The basis for approval or disapproval of transport permits is in other rules which prescribe management safeguards for native fishes (such as the Wild Fish Management Policy).

Rules that apply to the introduction of new species include the following:

Fish Management Goals (OAR 635-07-510)

(1) The overriding goal of fish management is to prevent the serious depletion of any indigenous fish species through the protection of native ecological communities, the conservation of genetic resources, and control of consumptive uses such that fish production is sustainable over the long term.

Operating Principles for Natural Production Management (OAR-07-523)

(2) Competition, predation and disease: Introductions of fishes of the same or different species as those already present may seriously reduce natural production through competition for food and space or through predation. Introduction of disease may also reduce natural production. The Department shall oppose any actions that allow competition, predation, or disease to prevent meeting natural production objectives of management plans.

Wild Fish Management Policy (OAR's 635-07-525 through 635-07-529)

(3) Gives the highest consideration to the protection and enhancement of wild fish stocks.

Management Plans (OAR 635-07-515)

(1) Resources of the state shall be managed according to plans which set forth goals, objectives and operating principles for management of species, waters, or areas. Such

plans are a primary means of implementing Department policies regarding fish management.

(2) The Warmwater Fish Plan adopted in 1987 under authority of OAR 635-07-515 which gives first priority to the protection of endemic salmonids.

The internal ODFW policy pertaining to new introductions is contained in "Guidelines for Fish Introductions or Transfers". This requires that proposals for new introductions go through the established fish introduction proposal review process and receive approval by the Chief of Fisheries. Those rules require that proposals be written and the first test to be met is to protect endemic species. Proposals must be reviewed for avoidance of biological harm and for creation of substantial new recreational opportunity. It also contains a number of conditions and safeguards that must be met before an introduction can proceed. Recently-updated stocking guidelines for warmwater fish limit new introductions to basins where the species already occurs or where there is no chance of escape into flowing waters.

The Department has been conservative in introducing new species into Oregon waters. Few new legal introductions have occurred since the 1970's. The agency does not approve introductions that will place native species at ecological, genetic, or disease risk. In the last 25 years only two new introductions of species capable of reproducing have been made in coastal drainages. One was the introduction of largemouth bass into Tenmile Lake in 1971 to prey on the growing bluegill population. The other was of black crappie into Town Lake, a small sand dune lake near Pacific City that already contained largemouth bass. The two other recent introductions of exotic fish into the coastal systems were of sterile or functionally sterile fish. One was of white-striped hybrid bass into North Tenmile Lake from 1982-88. This program was canceled due to concerns over fish straying into other waters. The other was of triploid grass carp into Devils Lake by the Devils Lake Water Improvement District in 1986, 1987 and 1993 to control aquatic vegetation.

Illegal introductions are a continuing problem with far-reaching ecological and management consequences which are often extraordinarily hard to reverse. At least 17 instances have been documented since 1987. Legal constraints are ineffective when the probability of being apprehended is very low. Whenever possible, the media and employee contacts with individuals and groups are used to educate the public about the damage to resources and fisheries that result from these irresponsible acts.

By rule, illegally introduced fishes have no standing in ODFW's fish management unless they are included in the objectives of fish management plans adopted by the State Fish and Wildlife Commission. In the past ODFW has often attempted to make the best of a circumstance beyond its control by managing to maximize the public benefits from the illegal introductions. This response could be interpreted as rewarding the perpetrators for their illegal act. Recently when largemouth bass appeared in Davis Lake the Department made the decision to actively manage against the species by excluding them from the statewide bag and size limits for bass. The decision was also made not to transplant bass removed from the lake to other waters where bass anglers could benefit from them (an exception was made to allow them to be stocked in a juvenile-only fishing pond).

The following table describes changes in fish distribution in the last decade due to illegal and legal introductions as well as natural expansion of distribution since adoption of the Warmwater Fish Management Plan in 1987.

Table II. Fish Introductions Since 1987.

Status	Location	Introduced Species
Illegal	Eel Lake	black crappie
Illegal	Prineville Res.	black crappie
Illegal	Saunders Lake	yellow perch
Illegal	Tenmile Lakes	smallmouth bass and black crappie
Illegal	Henry Hagg Reservoir	black crappie and bluegill sunfish
Illegal	Phillips Res. [1/]	yellow perch and walleye
Illegal	Town Lake	yellow perch
Illegal	St Louis Warm-Water Fishing Ponds	carp
Illegal	Diamond Lake	Tui chub
Illegal	Willamette River	golden shiners
Illegal	Cape Meares Lake	bluegill sunfish
Illegal	Crane Prairie Res. [2/]	largemouth bass, crappie, bluegill
Illegal	Rogue River [3/]	Umpqua squawfish
Illegal	Emigrant Res.	channel catfish
Illegal	Davis Lake 1/ [4/]	largemouth bass
Illegal	Langdon Lake	brook trout (subsequently chemically treated)
Illegal	Mid Fork Willamette River [1/,5/]	walleye
Legal	Town Lake	black crappie
Legal	Four Mile Lake [6/]	lake trout
Legal	Thompson Valley Reservoir	hybrid bass
Legal	Owyhee R. below reservoir	brown trout
Legal	Lake Lytle	black crappie
Legal	Devils Lake	triploid grass carp
Natural	Willamette River below falls	walleye
Natural ?	Willamette River above falls [1/]	walleye
Natural ?	Willamette River above falls	smallmouth bass
Natural ?	Brown trout [7/]	lower Deschutes R.

Footnotes:

[1/] Not protected by angling regulations.

[2/] The basin fish management plan contains specific management objectives for largemouth bass.

[3/] Umpqua squawfish is native to the Umpqua River, but is introduced to the Rogue basin.

[4/] Largemouth bass in Davis Lake are not protected by angling regulations.

[5/] Walleye in the Middle Fork are separated by a long distance from any other walleye known from the Willamette, suggesting that they were introduced rather than spreading naturally, not protected by angling regulations.

[6/] The OFWC adopted as an objective of the Klamath Basin Plan to review this proposed introduction which is still pending.

[7/] Brown trout in this reach originated from fish stocked in Lake Simtustus; the lake is no longer stocked with brown trout and the population in the Deschutes below the lake is not expected to persist.

Recent Management

The Oregon Department of Fish and Wildlife has sole management authority over these introduced fish species. None is under joint management with another state, nor do federal agencies have authorities other than those implicit in their habitat management. In the Columbia and Snake Rivers, concurrent management of shared populations is desirable for practicality of enforcement, but each state maintains independent regulatory authority. Striped bass, shad, catfishes, perch and walleye, sunfishes, black basses, and bullfrogs are classified by statute as game fish and are managed for

recreational fisheries by the Oregon Department of Fish and Wildlife. The only introduced species with statewide harvest restrictions are largemouth, smallmouth and striped bass, and the four species of salmonids.

Table III. General Regulations on Introduced Game fishes.

Species	Location	General Regulation
Striped bass	Coos and Umpqua Rivers	2/ day; 30 inch minimum
Largemouth bass*	Statewide	5/ day; no more than 3 over 15 in.
Smallmouth bass*	Statewide	5/ day; no more than 3 over 15 in.
Walleye	Columbia River only (not regulated elsewhere)	5/ day; 18 inch minimum; no more than 1 > 24 inches
Hybrid bass	Thompson Valley and Ana Reservoirs.	1/ day; 16 inch minimum
Atlantic salmon	Hosmer, East, Davis Lakes	Catch and release in Hosmer; otherwise part of regular trout bag
Lake trout	Deschutes Basin; Wallowa Lake	1/ day; 24 or 30 inch minimum, depending on location in Deschutes Basin; no size limit, part of regular trout bag in Wallowa Lake
Brown trout	Klamath, Deschutes, North Umpqua basins	Catch and release or 1, 2, , or 5 fish bag limits depending on location
Brook trout	Statewide in streams	None
Brook trout	Standing waters	General trout regulations except no limits in most NE Zone lakes
Sunfishes	Statewide	None
Crappies	Statewide	None
Catfishes	Statewide	None
Perch	Statewide	None
Shad	primarily Coos, Siuslaw, Umpqua and Columbia Rivers	None

Warmwater Game Fish

The Warmwater Fish Plan adopted by the Oregon Fish and Wildlife Commission in 1987 provides management direction for warmwater game fish. It sets the framework for development of the warmwater fish sections of basin fish management plans. The overall goal is to manage warmwater game fish and their habitats to provide optimum recreational benefits to the citizens of Oregon. Objectives are:

1. Provide a diversity of angling opportunities.
2. Expand distribution by stocking warmwater species where habitat is suitable and expansion is consistent with fish management programs.
3. Increase angling opportunities and use of warmwater species where desireable.
4. Maintain, restore and enhance populations of warmwater game fish in individual waters.

Most management since adoption of the plan has centered on improving existing fisheries. To provide a diversity of angling opportunities species in all waters are classified for management under one of four alternatives: basic yield, quality, high yield or trophy. Selection of appropriate alternatives must be consistent with public needs and biological constraints. Surveys, inventories and intensive investigations of fish communities and fisheries are conducted to provide the biological basis for management decisions. Management under the "quality" or "trophy" alternatives usually requires regulations that are more restrictive that those in general use. Angling regulations are intended to promote recreational benefits from popular fisheries.

More restrictive special regulations are in effect for largemouth, smallmouth and/or hybrid bass in 14 waters. Except for walleye in the Columbia River, the harvest of other non-native game fish species is not restricted. Other Management actions used to improve warmwater fish populations and fishing opportunities include:

1. Developing strategic plans and comprehensive management systems to provide long-term management direction.
2. Developing and stocking new waters or doing supplemental stocking after fish kills or where recruitment is limiting. Recent emphasis on increasing angling opportunity in urban areas.
3. Enhancing warmwater fish habitat to attract fish to anglers or to enhance fish populations.
4. Conducting research to evaluate management actions and answer long-term management questions (recent emphasis on species other that bass - Emigrant crappie).
5. Providing information on warmwater fish management to other agencies and the angling public.

Table IV. Special regulations for warmwater fish in effect in 1998.

Species	Water	Acres/Miles	Regulation	
			Bag	Size
LB	Lytle	69	0	Catch and Release
LB	Garrison	90	1	15" minimum
LB	Selmac	148	1	None
LB	Cottage Grove	1139	5	15" maximum
LB	Prineville	3136	5	12" min./3 over 15"
LB	Dog	189	3	15" minimum
LB	Lake of the Woods	1146	5	1 over 15"
LB	McKay	1316	3	15" minimum
SB	Prineville	3136	5	10-14" slot
SB	Umpqua Basin	286 miles	10	None
LB/SB	Hells Canyon	2400	5	12" minimum
LB/SB	Oxbow	1145	2	12-16" slot;spring C&R
LB/SB	Brownlee	15000	5	12" minimum
HB	Ana	60	1	16" minimum
HB	Thompson	1802	1	16" minimum
All WW	Davis	3906	*	*No limits

Introduced Trout

Brook Trout

Brook trout are an important component of high lake fisheries (e.g. Central Oregon Century Drive lakes). The primary concern is that stocking of lakes may contribute to stream populations that could compete with native species. The current thinking is that impacts on native fish occurred years ago and that stopping lake stocking now wouldn't help. Bag limits on brook trout in streams have been removed, but the benefits to native species will likely be negligible.

Brown Trout

Stocking is limited to the lower Owyhee River using brood fish from Wickiup Reservoir as an egg source. Brown trout do better than native redband trout in sections of the Deschutes River that are impacted by artificially manipulated flows. Though not abundant, brown trout provide the only trout harvest in this area and are protected by a 2-fish bag limit. Redbands in this area are protected by a catch and release regulation.

Lake Trout

Lake trout occur in only five Oregon lakes, Odell, Crescent, Summit and Cultus in the Cascade Mountains of Central Oregon, and Wallowa Lake in Northeast Oregon. A conservation concern is for bull trout in Odell Lake. A 30-inch minimum is in place to protect smaller bull trout that might be misidentified by anglers and kept for lake trout.

Atlantic Salmon

Atlantic salmon are currently stocked in only two lakes, Hosmer and East, neither of which has native fish concerns.